

The Chemist's Role In Nuclear Medicine

Alfred P. Wolf, Chemistry Department, will discuss "Radiopharmaceutical Research" in the 148th BNL Lecture on Wednesday, June 29, at 8:30 p.m. in Berkner Hall.

Nuclear medicine is a field in which radiation and radionuclides are used in the diagnosis and treatment of disease. One branch of this field is the development, production, and use of radiopharmaceuticals for the purposes of morphological studies, assessment of organ function, and metabolic processes, and therapy.

Wolf's presentation will highlight the



Alfred P. Wolf —photo by Rosen

chemist's role and tasks in the interdisciplinary field of nuclear medicine. He will discuss the problem solving approach employed in the design of accelerator-produced

short-lived radionuclides and their incorporation into radiopharmaceuticals.

The lecturer will discuss one class of radionuclides, positron emitters, emphasizing the constraints imposed upon the system in which the chemist works in developing these new drugs, and the assistance he has through parallel technical advances of detection systems for the radiopharmaceuticals.

Wolf joined the staff of the Chemistry Department on receiving his Ph.D. degree from Columbia University in 1952. His research has been concerned with organic reaction mechanisms, hot atom chemistry, the investigation of excited chemical species, and basic and applied research in nuclear medicine. Since 1954 he has utilized accelerators for research, and for over ten years has had an active program at the 60" cyclotron in the production of radioactive nuclides for radiopharmaceutical research and use in nuclear medicine. In 1971 he received the American Chemical Society Award in "Nuclear Applications in Chemistry."

Among various other activities, Wolf is an Adjunct Professor of Chemistry at Columbia University, and is a consultant to the International Atomic Energy Agency and to the Latin American Society of Biology and Nuclear Medicine. He serves as an advisor to the Italian National Research Council, and is an elected member of the Board of Directors of the Radiopharmaceutical Science Council of the Society of Nuclear Medicine.

He has more than 150 publications in the literature and is an editor of the Journal of Labelled Compounds and Radiopharmaceuticals.

A buffet supper will be served in the Brookhaven Center before the lecture beginning at 6:30 p.m. Reservations should be made in advance by calling Ext. 3541 before 5 p.m. Refreshments will be available in the lobby of Berkner Hall immediately after the lecture.

Hudis To Head Chemistry As Friedlander Returns To Research



Gerhart Friedlander (left) and Jerome Hudis —photo by Rosen

On July 1, after nine years as head of the Chemistry Department, Gerhart Friedlander will return to research and a myriad of other activities, and Jerome Hudis will assume the chairmanship.

Throughout these nine years, Hudis has worked closely with Friedlander, first as assistant chairman and since 1972 as deputy.

Recently they reflected on the administration of the department. Friedlander says that because the two biggest problems are budgets and people, "a chairman has to be a mixture of bookkeeper and psychiatrist." In the early days of his tenure as chairman, he was hit with shrinking budgets and the subsequent layoffs which bottomed out in 1973. "During these times," he says, "I tried to have as much communication and openness in the department as possible. This was important for morale, because although things were bad, at least people knew what was going on." Since then, the department has been expanding into new areas of research and he has found it gratifying to start rebuilding the staff.

Both he and Hudis concur on giving scientists the best possible atmosphere in which to do their work. "It is up to the chairman to take the brunt of bureaucratic and administrative chores," says Hudis, "and both Dodson (the first chairman) and Friedlander have done a fantastic job in keeping scientists free from petty details." Hudis recently gained valuable administrative experience after spending a year at ERDA headquarters. He says he now knows what it is like to be at the other end of the telephone, and has a greater appreciation of ERDA's difficulties and needs.

Since the department will average one retirement a year for the next ten years, Hudis sees this as an ideal time to enter new fields of chemistry and to build up the

staff with bright young scientists. He also feels it is important to give younger members administrative duties and experience.

Both Hudis and Friedlander agree that the most exciting experiment in the department during the last decade was Ray Davis' solar neutrino experiment which has contradicted a lot of theoretical expectations about the predicted flux of solar neutrinos, and is the subject of continuing controversy. After July 1, Friedlander plans to devote more time to the solar neutrino program to work further on the "puzzle."

Over the years, the joint nuclear medicine program of the Chemistry, Medical and Applied Science Departments has really flourished, says Friedlander. And, with energy the No. 1 problem in the land, some groups in Chemistry who have been doing long term basic research have shifted emphasis. "Their fundamental research is now directed with an eye to possible end uses as new energy sources," says Hudis.

Friedlander, who will be 61 next month, says he plans to slide into retirement gradually. To this end, he is going on 80% time "to see what retirement is like." After July 1, he will not only work on the solar neutrino project, but will serve as executive secretary of an ERDA panel, consisting of one representative from each of nine laboratories, which will advise the Division of Basic Energy Sciences on their programs. He will also act as a consultant to a New York publisher, and to Lawrence Livermore Laboratory in California. He heads a committee for the National Research Council which is responsible for the scientific reviews of grant proposals that the Army Research Office gets in basic research. He chaired a National Research Council panel on the future of nuclear science, and that panel's report, which he has

(Continued on page 2)

Scientists Home From The Sea

A 23-day cruise off the coast of South America is a romantic vacation for most people. To serious scientists in DAS however, the trip was work - another research opportunity.

The oceanographers were particularly interested in the effects of "coastal upwelling" on the food chain of an ecosystem. Upwelling is a process of water rising from a deeper to a shallower depth.

Waters off San Martin, Peru, where this research cruise focused, comprise one of the most active upwelling ecosystems in the world. Steady winds in the area blow towards the equator moving water at right angles. This process is called "Ekman transport."

The transport of surface water out to sea, causes colder water from beneath to rise. Upwelled water brings a fresh supply of nutrients to the surface. This physical phenomenon then expresses itself biologically.

Phytoplankton are single-celled plants which drift near the surface, making use of available light for photosynthesis. They thrive on the additional upwelled nutrients. And this passes up the interdependent food chain, through tiny crustaceans (only a quarter-inch long/4-5 millimeters) and fish, eventually to birds and man.

The BNL Team

In addition to several excellent tans, the BNL team of 16 researchers brought back volumes of data at the end of April that they will spend months analyzing. The results can then help test and reinforce more general models based on their regular study of New York's coastal ecosystem.

John Walsh, head of BNL's Oceanographic Sciences Division, was Co-Chief Scientist along with James Kelley, San Francisco State University, aboard the *Melville*. This trip, which included three other research vessels, was the last in an eight-year series of cruises through Peruvian waters.

This extended program, known as the

Coastal Upwelling Ecosystem Analysis, is a National Science Foundation project. Several of the Brookhaven scientists have joined in this research effort before under the International Decade of Ocean Exploration, which President Johnson first proposed.

Looking at Higher-ups

The biological emphasis of past cruises in the Coastal Upwelling Ecosystem Analysis was on phytoplankton, plants which are the primary producers in the food chain. On this trip, the researchers decided to take a closer look at organisms the next step up . . . namely, zooplankton. These small shrimp-like animals graze on phytoplankton.

"Previous cruises did not have the personnel or the developed techniques to study

(Continued on page 2)



Conducting experiments in a lab is no way to study the sea according to oceanographers in DAS. They like to get into the middle of what they are studying.

Small Business Gets Large Contract



Process Systems, Inc., a small firm in Bohemia, New York which specializes in cryogenic equipment and fabrication, has been awarded a contract for \$155,705 to build a helium refrigerator cold box assembly for the proposed ISABELLE project. The award was made to PSI in competitive bidding against three large firms. The Division of Contracts and Procurement is constantly on the alert for small business concerns from which to solicit bids for Laboratory projects. Present at the signing of the contract last week were: (from left) Lauri N. Koivula, Subcontracting Specialist, Small Business Administration, New York Office; R.S. Walters, Vice President, Sales, Process Systems, Inc.; Don Brown, BNL ISABELLE Cryogenic Engineer; N.S. Masciopinto, Senior Buyer, Division of Contracts & Procurement; A.P. Lewis, Manager, Division of Contracts & Procurement; Guy Barbolini, President, Process Systems, Inc.

Sailor/Scientists (Cont'd)

zooplankton," explained Michael Dagg. This year the entire biological staff of the Oceanographic Sciences Division went along, adding both range and versatility to the ship's crew, which numbered over 50.

While graduate student Creighton Wirick manned nets to catch the zooplankton, Dave Judkins operated one of the new instruments. With the assistance of Bob Sick, Rowland Hautsch, and Ann Herriott they performed a similar task using a pump system.

Making use of this sophisticated collection device, the BNL team was able to study the precise distribution and abundance of zooplankton at low levels. Development of this technique on a large scale has been pioneered at Brookhaven.

Another area of vital interest was the actual link between zooplankton and phytoplankton through grazing. Dagg was assisted by Dave Grill in his investigation of feeding rates.

"Zooplankton feeding is dependent upon the concentration of food available (phytoplankton)," said Dagg. "So we took different water samples and studied the size-spectrum of the phytoplankton before and after putting in zooplankton."

In addition Carl Boyd and Sharon Smith, visitors from Dalhousie University, took an opposite approach. Taking the zooplankton from different samples of water, the researchers would grind the organisms and then measure the fluorescence of plant pigment. This pigment, which could only come from the gut, serves as an indicator of phytoplankton consumed.

Dagg said, "Basically we wanted to find out where the zooplankton was and what it was doing. Terry Whitledge and Charles Patton looked at excretion, while a graduate student, Steven Howe, studied zooplankton respiration."

With the technical assistance of Evarina Wold in chlorophyll analysis and Tom Owens in nutrient analysis, Walsh maintained a computer map of these factors as they passed through new waters. This gave them the special advantage of immediately knowing the most active areas warranting further examination.

Trial Run

One new piece of equipment, the "FTD" developed by Wayne Esaias and Whitledge, was on its maiden voyage this trip. The FTD, which measures fluorescence, temperature, and depth, is a new innovation for studying phytoplankton distribution and abundance.

The old system relied on taking water samples at different depths with a small pump. Then fluorescence -- an indicator of phytoplankton abundance -- was measured, but mixing of water in the pump hose introduced some error.

Data can be collected more accurately and with less work, because the FTD records information while it is towed underwater. Again, fluorescence from plant pigments is used as an indicator for the biomass of phytoplankton present.

But in one sense, the recent research cruise through Peruvian waters was a trial run for everyone. Although the Oceanographic Sciences Division has participated in over 25 major cruises in the last two years, this was the first chance the entire group had to work together on one ship.

"Many of the personnel use research equipment that is a step or two ahead of the typical oceanographic approach," said Dagg. "The opportunity to integrate all the gear on the same cruise was greatly appreciated."

Later this summer, this group will take advantage of the experience gained in Peru. Even now, they are preparing for a similar cruise within their principal area of investigation, called the New York Bight.

—Cliff Cockerham

Friedlander & Hudis (Cont'd)

been working on for the last 18 months, has just been published. Friedlander has been nominated for a Humboldt fellowship in the fall of 1978 in Germany. He will also continue his activities in Planned Parenthood to which he has been committed for a number of years.

This hardly sounds like he will have much time for lying around in a hammock. As Hudis says, "he has actually signed up for 150% of his time."

Jerome Hudis obtained a Ph.D. degree in chemistry from Washington University, St. Louis, in 1952 and that same year joined the scientific staff of the Chemistry Department. His research has been in the fields of high energy nuclear reactions and X-ray photoelectron spectroscopy. He is a member of the American Chemical Society, American Physical Society and the American Association for the Advancement of Science.

Gerhart Friedlander was born in Munich, Germany and came to the United States in 1936. He received his Ph.D. in nuclear chemistry from the University of California at Berkeley, six years later. Following three years at Los Alamos on the Manhattan Project, he was a member of the staff at General Electric's Research Laboratory in Schenectady. He joined the BNL Chemistry Department in 1948, and his principal research has been in nuclear reactions. He was elected to the National Academy of Sciences in 1973 and is a Fellow of the American Physical Society and a Fellow of the American Academy of Arts and Sciences. He is also a member of the American Chemical Society and the American Association for the Advancement of Science.

Arrivals & Departures

Arrivals

Fulvio Cacace.....Chemistry
Daniel L. Costa.....Medical
John E. Dickman.....Physics
Donna Marie R. Feldman.....Contr. & Procm.
Reginald A. Hunt.....Plant Engrg.
Donald J. Jesaitis.....Plant Engrg.
Claudio Rebhi.....Physics
Thomas C. Stuart.....Accelerator

Departures

Paul Piccione.....Plant Engrg.
Ronald D. Pillsbury.....Applied Science

Summer Rec Reminder

The 1977 Children's Summer Program is scheduled to begin on Wednesday, July 6.

Information sheets, along with application forms for both the swimming lessons and the on-site recreation program, may be picked up at the Personnel Office, BERA Film Service Office, Pool, and from Lisa Klopfer in the Apartment Area.

Deadline date for registration is Thursday, June 30. Applications with registration fees should be forwarded to Blanche Laskee, Recreation Office, Building 185.

Great Adventure Discount Offer

BERA is happy to announce an arrangement with "Great Adventure" to offer Lab and other on-site employees special combination tickets regularly selling for \$11.50 at a money-saving cost of \$9.00. The bearer of this ticket is entitled to entry into Safari Park and also unlimited use of rides, shows and attractions in Entertainment Park.

Great Adventure, a fun-filled and exciting playland for young and old, is located in Jackson, New Jersey, about an hour and a half hour's drive from the George Washington Bridge.

Tickets, along with colorful information brochures, are now available at the BERA Film Service Office. Office hours are from 11:00 a.m. to 3:00 p.m., Monday through Friday. Rae Stelts, Ext. 3347, will gladly answer questions about the ticket sales.

Sign Up
For The
Blood Drive
June 29-30

Retiring
at the end
of June



Jean V. Domish



Edward Malcolm



Arthur M. Swenson



Michael A. Laino



Peter C. Delmonte



Edward Wirsing



Rhoda C. Sparrow

The following employees will retire at the end of the month. We wish them well.

Peter C. Delmonte, is a General Supervisor in Central Shops and joined the Laboratory October 16, 1950.

Jean V. Domish, came to Brookhaven July 1, 1954 and is a Mathematics Associate in the Physics Department.

Michael A. Laino has been a Laboratory Custodian in Plant Engineering since May 26, 1969.

Edward Malcolm, an Electrician in Plant Engineering, started at Brookhaven September 10, 1962.

Rhoda C. Sparrow, a Biology Associate in the Biology Department, came to Brookhaven in the early years. She joined the staff on February 11, 1948.

Arthur M. Swenson, joined the Laboratory September 5, 1950. He is a Senior Technical Specialist in the Chemistry Department.

Edward Wirsing, an Associate Chemical Engineer in the Department of Applied Science, joined the staff on October 29, 1951.

Cooking Exchange

Thank you all for a most enjoyable two years as chairman of the Cooking Exchange. I have enjoyed every meeting -- even when we had problems. For those of you who missed this year's International Dinner, I'm sorry; next year, demonstrate. For those who enjoyed the dinner with me, thank you, it was delicious! For those very nice people who asked for the shrimp recipe, here it is:

Marinated Shrimp

Marinate 1 lb. unshelled shrimp (washed) in a mixture of 1 Tbsp. soy sauce, 2 Tbsp. Worcestershire sauce, 1 Tbsp. dry sherry, and 1 Tbsp. brown sugar. Marinate for 30 minutes, then place shrimp and sauce in a baking pan and bake for 25 minutes at 300° F. Serve either hot or cold. Guests have to shell their own.

I'm looking forward to seeing all of you next September when Elaine Lowenstein takes over as chairman for another exciting year of cooking.

— Judy Mills



Hard at work analyzing data in one of the labs on ship is Tom Owens. In the background Jim Rix, San Francisco State University, feeds raw data into the computer for immediate analysis. Other members of the crew are on deck collecting more data for analysis. —photos by Dagg

BROOKHAVEN
BULLETIN

Published weekly
for the employees of
BROOKHAVEN NATIONAL LABORATORY

BERNICE PETERSEN, Editor
DOUG HUMPHREY, Photo-Journalist
CAROL PETRAITIS, Editorial Assistant

40 Brookhaven Ave., Upton, N.Y. 11973
Telephone (516) 345-2345

CARL R. THIEN, Public Relations Officer

Rambling Around

These are bits and pieces picked up from here
and there with occasional observations by the
Editor:

- The League of Women Voters has received a \$200,000 grant from ERDA to support the League's national energy education program. The League plans "to build a corps of energy experts who can effectively educate and provide citizens with information about the nature of our energy problems and alternative solutions from international, national, regional and state perspectives."
- See if you can find a loophole in the following item from a National Park Service document: "No person shall prune, cut, carry away, pull up, dig, fell, boar, chop, saw, chip, pick, move, sever, climb, molest, take, break, deface, destroy, set fire to, burn, scorch, carve, paint, mar or in any manner interfere with, tamper, mutilate, misuse, disturb or damage any tree, shrub, plant, grass, flower, or part thereof, nor shall any person permit any chemical, whether solid, fluid or gaseous, to seep, drip, drain or be emptied, sprayed, dusted on, injected upon, about or into any tree, shrub, plant, grass, flower."

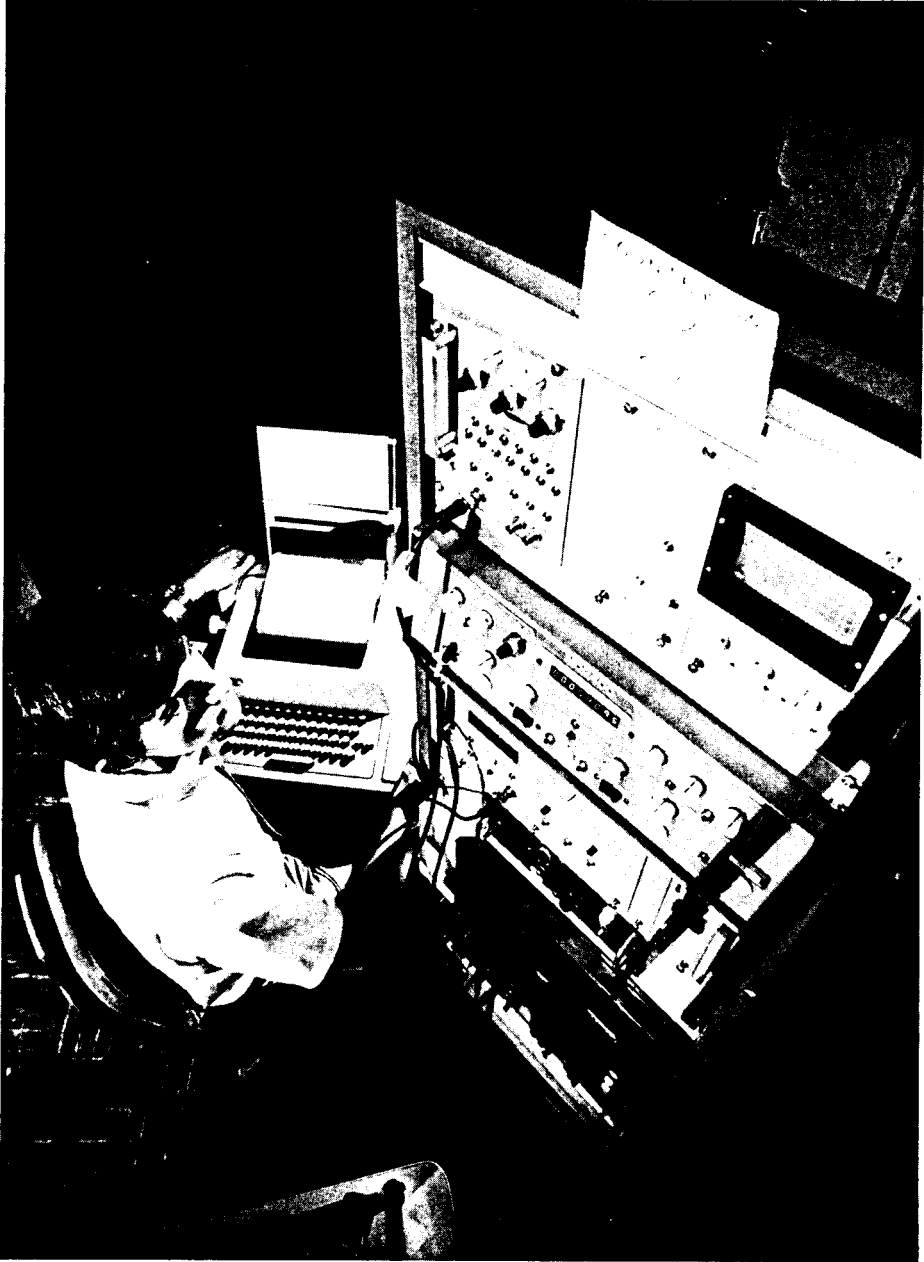
CREF Values

1976			
January	\$40.31	February	\$39.76
March	40.75	April	40.10
May	39.69	June	41.60
July	41.21	August	40.94
September	41.59	October	40.62
November	40.40	December	42.66
1977			
January	\$40.27	February	\$39.30
March	\$38.73	April	38.73
May			
\$37.96			

Cafeteria Menu
Week Ending July 1, 1977

Monday, June 27	
Corn chowder	
Beef chop suey on rice	1.15
Scrambled eggs, sausages, fr. fr.	1.10
Hot deli - pastrami	
Tuesday, June 28	
Beef noodle soup	
Knackwurst & sauerkraut	1.10
Sauerbraten & potato pancake	1.35
Hot deli - veal pattie & peppers	
Wednesday, June 29	
Cream of potato soup	
Braised meatballs a la mode on buttered noodles	1.15
Hot deli - corned beef	
Davy Jones Fish Fry Special	
cup of soup	
Davy Jones Fish Fry	
pie or ice cream	
small beverage	\$1.87 plus tax
Thursday, June 30	
Chicken vegetable soup	
Cheese ravioli & 1 veg.	1.05
Roast chicken, stuffing, 1 veg.	1.15
Cold deli - 8 foot hero purchased by the inch. Includes: salami, ham, provolone, bologna, marinated Italian style tomatoes, sliced onions, shredded lettuce, & peppers. 55¢/inch.	
Friday, July 1	
Fish chowder	
Spaghetti & clam sauce	1.05
Breaded pork chop & 1 veg.	1.35
Hot deli - smoked tongue	

Chemistry Featured on Saturday Tour



Some Chemistry Department laboratories and experiments will be on public view Saturday, June 25. Featured will be the Brookhaven solar neutrino experiment. Also of interest are some practical applications of neutron activation related to pollution problems. Above, Research Associate David Hickman at the multi-channel analyzer used to measure the gamma spectrum of an irradiated sample of pine needles to determine its metallic content.

Trips To New York City

The Hospitality Committee is planning two group railroad trips to the city. The first one will be Wednesday, July 13, and the second will be Wednesday, July 27.

For those who are interested, a group will be going to the Bronx Zoo on the July 13 trip. If you would like to go along, please insert a note with your check indicating that you would like to take this side trip and how many adults and how many children will be going. There is no admittance charge to the zoo; however, since the subway will be used to get there, tokens will be needed for the round trip fare. These may be purchased at the Patchogue LIRR station and it is suggested that you buy them there rather than wait until you get to Penn Station. It will save a lot of time and confusion.

Each of the train trips will be limited to 120 people. Departure will be at 8:32 a.m. from the Patchogue LIRR station. The round trip fare is \$2.45, children under six ride free.

Reserve a ticket by sending your fare through the U.S. mail to P.O. Box 322, Upton, New York 11973, no later than Thursday, July 8, for the first trip, and Thursday, July 22, for the second. Make checks payable to "Brookhaven National Laboratory," and indicate on your check which trip you are taking. If you are planning on taking both trips, please send a check for *each* one. Tickets will be given to you at the train station. Refunds will be made only if cancellations are received at least two days prior to the trip.

Golf

All BNL employees are invited to play in the next 18-hole golf tournament which will be held Tuesday, June 28, at the Flag Country Club.

Prizes will be given for low gross, low net, longest drive, closest to the pin, and more!

Tee off times 11:30 a.m. to 1:00 p.m. Send entry fee of \$1 to Les Lawrence, Bldg. 515.

It's. . . . Cricket

BICC triumphed 104-72 in one innings of 35 overs, against the visiting Cornell University Cricket Club. Captain Dibyendu Banerjee scored 34 runs and bowled to put out four Cornell batsmen. John Millener had 28 runs, and his fierce bowling, unleashed for the first time on BICC's new home pitch and mat, undid five more of the opposing batsmen.

The top scorer of the match was Bala Iyer of the Cornell team. His brisk innings of 36 runs came out of 7 hits to the boundary. The bowling of the Cornell team by Panda, Praveen and Bhanot was probably the best the home team has ever faced. Although the Cornell team lost the match, they displayed an impressive array of batting, bowling and fielding. The game was never without its tense and exciting moments.

There is another home game scheduled for this Sunday at 1 p.m. against the Oyster Bay Cricket Club. All are welcome. All those interested in playing cricket are encouraged to come to the regular practice held every Tuesday after work.

Bicycle Tours

The 25 mile round-trip beginner's tour is this Sunday, June 26; meet at Berkner parking lot at 10:00 a.m., lunch at Wildwood Park and return around 3:00 p.m. This is a slow-paced tour, with the only sweaty part being a couple of hilly miles along North Country Road.

Coming up July 10 is a tour for more advanced cyclists: the 65 mile round-trip Riverhead Run. This is a one-day loop around western Peconic Bay via Riverhead, Sag Harbor, Shelter Island, Greeport and back to Riverhead.

For additional information, contact Gerry Morgan, Ext. 4841 or 289-5433.

Gym to Close

Due to the Blood Drive next week, the gymnasium will be closed to all athletic activities on Tuesday, Wednesday and Thursday, June 28, 29 and 30. Normal schedule will resume on Friday, July 1, at noon.

Equipment Exhibit

Arrangements have been made to bring the Varian VacMobile featuring "Vacuum in Action" to Brookhaven on Wednesday, June 29, 1977. The vehicle will be parked in the Cafeteria Parking Lot from 10:00 a.m. to 2:30 p.m.

Equipment on display will be the VGA-100 Gas Analyzer, Barrel Gauge Controls, 936 Leak Detector, Stainless Steel Valve Trap Combination, 845 and 862 Digital Gauge Controls, Fixturing, S-Gun Deposition Equipment and miscellaneous hardware.

Soccer

BNL took it on the chin at Riverhead this past Sunday, 4-1. Chances were at hand many times, but the proper finish was absent. BNL will need better defense against the New York Oldtimers on Saturday, June 25 at 2:30.

A rematch with East/Center Moriches-Eastport will be on Monday, June 27 at 5:45.

The Brookhaven Town League action will start July 5; games are being scheduled for Tuesday and Thursday evenings starting at 6:45 - forfeit 7:00.

Classified
Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position, with consideration given to candidates in the following order of priority: (1) present employees within the department, with preference to those within the immediate work group; (2) present employees within the Laboratory as a whole; and (3) outside applicants.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all nonscientific staff positions; second, to give employees an opportunity to request consideration for themselves through Personnel; and, finally, for general recruiting purposes. Because of the priority preference policy stated above, each listing does not necessarily represent an opportunity for all candidates. As a guide to readers, the listings are grouped according to the anticipated area of recruitment, as indicated below. Except when operational needs require otherwise, positions will remain open for one week following publication date.

For further information regarding a placement listing, contact the Personnel Placement Supervisor, Ext. 2874 or 2882.

- LABORATORY RECRUITMENT:** Opportunity for present Laboratory employees.
223. DIVISION SECRETARY - To perform primarily technical secretarial work for division head and staff members. Requires experienced secretary with excellent typing and organizational skills and good knowledge of BNL policies and procedures. Knowledge of shorthand and dictating equipment desirable. Safety & Environmental Protection Division.
224. OFFICE SERVICES ASSISTANT - Knowledge of BNL policies and procedures relating to procurement, inventory control, travel and transportation is desirable. Physics Department.
- OPEN RECRUITMENT:** Opportunity for present Laboratory employees and outside applicants.
225. COMPUTER SCIENCE ANALYST - BS or equivalent in computer science, physics or applied math with competence in system level programming in Fortran and Assembly languages. Background in time-sharing system on Xerox Sigma 7 and data fitting techniques is desirable. Physics Department.
226. COMPUTER SCIENCE ANALYST - BS or equivalent in computer science or related area with background in operating systems development. Department of Applied Mathematics.
227. SR. MECHANICAL DESIGNER - Requires extensive background in piping, pressure vessel, structural and machine design. Engineering Division, Department of Applied Science.
228. SR. MECHANICAL DESIGNER - Requires extensive background in the design of precision components, mechanical structures, vacuum systems and in shop practices. National Synchrotron Light Source, Physics Department.
229. TECHNICIAN - AAS or equivalent in mechanical technology. Working background in a precision equipment environment would be desirable. Physics Department.
230. TECHNICIAN - AAS or equivalent in electronic technology to perform maintenance, repair and modification, testing, operation, and construction of equipment and facilities relating to scientific investigations. Experience with vacuum systems desirable. Rotating shifts. Tandem Van de Graaff facility. Physics Department.
- Autos & Auto Supplies**
- 65 MG MIDGET - British racing, green, good running cond, wire wheels. \$750. Carl, 744-2069.

FRONT BUMPER - Ford F250 p/u, sm dent. \$20. Bob, Ext. 4228.

66 CHEVY CONVERTIBLE - New top, runs well. Asking \$450. 924-5203 after 5.

70 FORD GALAXIE - 2 dr, ps/pb, ac, 351 eng. \$700. John, Ext. 4543, 924-4262.

73 PLYMOUTH DUSTER - V8, 3 spd, excel cond, G60's, Crager mags, headers, hjackers. Asking \$2000. 475-3657 after 5:30.

71 VW - Superbeetle, red, auto, good cond, am/fm 8-track stereo, back window defogger, must sell. \$900 or best offer. Toshi, Ext. 2115.

67 VW SQUAREBACK - Kept in cond, runs good. \$450. 286-1192 after 6.

76 CHEVY PICK UP - ½ ton, 8' bed, 6 cyl, standard, step bumper, 6000 mi, perfect. \$3200. 744-5124.

68 PONTIAC CATALINA - 4 dr sedan, ps/pb/ac, 4 new tires, good cond. \$600. JU8-3775.

68 CHEVY IMPALA - Station wagon, ps/pb, am radio, new brakes and battery. \$550. Fred, Ext. 2463, 473-8622 after 6.

71 CAPRI PARTS - Engine 2000 cc, traws, seats, doors, hood & front fenders. John, Ext. 4520.

61 VW - Sun roof, good mech cond, for second car. \$125. 473-4899.

75 MARK II - Ac, am/fm stereo, automatic, 6 cyl, 18,000 mi, mint cond, still under warranty. Asking \$4200. 281-7950 after 5.

WHEEL RIMS - Fits Dodge, Chrysler, Plymouth w/ 2½" hub. Joe Ash, Ext. 2983.

72 DODGE POLARA - 318 eng, auto trans, ac, excel running cond. \$850. Whitey, Ext. 2913, 928-3088.

65 BUICK SPECIAL - V6, std shift on floor, 2 dr, Hugh Rhodus, Ext. 3284, 924-3522.

CLASSIC 65 BUICK RIVIERA - White, all power options, ac, superior cond. \$1500. Sue, Ext. 3675.

75 PORSCHE 914 - 1.8 liter, 40,000 mi, 5 spd, excel cond. \$4900. Bob, 744-8980, 473-5522.

70 FIREBIRD - Formula 400, 4 spd, new white paint, excel cond. \$2400. Chris, 928-0043.

65 BUICK SKYLARK - 310 V8, excel cond. 473-0178 after 7.

VW SEATS - Reclining buckets, new for model 411 sedan, black. \$45. Daly, 363-2497.

4 TIRES - 6.50-16 w/wheels, Jeep. \$40. 928-1020.

66 LINCOLN CONTINENTAL - As is, new tires & battery. Asking \$250. 286-8921.

75 AMC PACER - Red, std shift, bucket seats, excel cond, good gas mi. \$2500. Gail, Ext. 3653, 878-4664.

65 OLDS - F-85, auto, ps/pb, 4 dr, new suspension, exhaust, good motor, good transportation. Karen, Ext. 3623, 286-1944.

66 OPEL - 2 dr, std, sedan, good mech cond, new tires & battery. \$200. 281-2012 after 6.

76 HONDA CB 360T - 1452 mi, disc brakes, elec start, windshield, crash & sissy bars, luggage rack. \$1200. Susan, Ext. 2089.

73 YAMAHA 350 cc - Like new, just tuned. \$550. Ext. 3688, 363-7032.

72 CHEVY CAPRICE - Ps/pb/ac, low mi, excel cond. \$1350. 473-0178 eves.

59 MGA CLASSIC - Fully restored, immaculate cond, white w/black top & interior. \$2400. Gene, Ext. 4670, 744-3945.

64 JEEP WAGONEER - 4 wheel drive. \$750. Ext. 2209, 286-3970.

72 FORD GALAXIE - 4 dr, ps/pb, automatic, tinted glass, hesitation wipers, excel cond. \$1500. Bob, Ext. 3386, 878-1471 after 5:30.

2 NEW TIRES - Used for 10 mi w/rims, for Comet or Falcon, 78-13; also muffler system. 981-0917.

YAMAHA 250 - Enduro motorcycle, like brand new, 700 mi, orig owner. \$495. 981-0917.

75 PINTO STA WAGON - Ac, std 4 spd shift, 29,000 mi, perfect cond. \$1995. Ext. 3593.

2 WIDE TIRES - Goodrich, t/a, G60-14, white lettered, also avail w/Cragar mags. Ron, 473-5939 after 7.

5 GM WHEELS - 16", 6-lug w/tires. \$2 each. 363-6597.

CAR RADIO - New am pushbutton deluxe model, Audiovox. \$20. Ext. 4532.

USED RIMS - Most sizes, installed & leak tested. \$5 each. Fred Usack, Ext. 4597, lunchtime calls only, or 475-4935 eves.

Boats & Marine Supplies

8' PRAM - Oars & oarlocks. \$75. Bill Dieffenback, Ext. 2434.

18' x 6' DOUBLE ENDER - Marine plywood on oak frame, 1500 lbs, ballast, bronze screw fastened, sloop rigged. Best offer. 298-8601.

15' COBIA - 1972 w/73 50 hp Merc outboard & trailer, excel cond. \$1600. 744-2688.

18' SKIFF - Rag top, 4 cyl, eng, 2 gal tank, preservers, etc, excel fishing boat. \$550. Tom, 325-1033.

35 HP OUTBOARD - Chrysler, 3 yrs old, short shaft & 14' MFG w/wood decks. Asking \$700, will also sell separately. Ext. 2633.

24' SAILBOAT - International 110 class boat w/sails & trailer. \$600. 744-4965, 744-8240.

18' CC - Mast, boom sails & misc hardware. Ralph, Ext. 2485.

19' RACING DINGHY - Fiberglass flying scott/day sailer. Asking \$2500. 878-4878.

20' DEEPEE - Fiberglass runabout fw, 165 hp, V8, very good cond. Price negotiable. 286-0237 after 6.

19' CRUISER CHALLENGER - 1973, 115 hp Merc o/b, hydraulic trim, depth sounder, cb radio, many extras, mint cond. \$5000. Ext. 2482, 732-0974.

16' SNIPE SAILBOAT - Excel cond, daggerboard. \$600. Ext. 4317, 286-0128.

68 PEMBROKE - 28' cabin cruiser, sleeps, twin 190 hp Chevy engs. \$7900. 928-5130, 928-2727.

12' DORY - 1972 Starcraft D, alum, 9½ hp Evinrude Fisherman eng, trailer, used less than 10 times, mint cond. \$650. Ext. 2482, 732-0974.

73 JOHN ALLMAND STINGER - All fiberglass 23', 120 hp mercuriser, V bunks, fully equipped, ready for water w/slip for season. \$4750. Colleen, Ext. 2878, 751-3686.

16' GLASSMASTER - Fiberglass w/elec Evinrude. 765-2102.

15' SAILBOAT - International 470, complete set sails. \$900. Dave Lloyd, Ext. 4391, 862-9178.

Miscellaneous

GARAGE SALE - June 24, 25, 177 N Wading River Rd, Wading River (¼ mi east of Little Flower).

GARAGE SALE - June 25, 26, leaving country – appliances, tools, infant items, etc. 23 Three Sisters Road, St. James.

GARAGE SALE - June 24, 25, 97 Dunton Ave, E Pat-chogue.

YARD SALE - June 25, 9-3, 937 S Country Rd, Bell-port, 2 blocks west of golf course, furniture, rum-mage, baby items.

YARD SALE - June 25, 26, Senix Ave (Street at MacDonalds) Center Moriches.

HUGE YARD SALE - 4 families, Sat, June 25, 10-6, 199 Jayne Blvd, Pt Jeff Sta.

2 WHITE UNIFORMS - \$5 ea; ladies shoes, 9½A, Socialites, \$7; elec hair set, \$3; other clothing, ladies & children. Call Walt, Ext. 2907, 698-0576 after 5 p.m.

BICYCLES - 1 green 3 spd high riser, \$15; 1 high riser, \$15; big wheel tricycle, \$10; all in good cond. Ext. 3126.

PRESS - Book binder, very strong iron const, plate size 12¼ x 9¾. \$35. Ext. 4240 or 286-0295.

TELESCOPE - 60 mm prismatic, for bird watching or astronomy, precision table top tripod with Vernier control. \$35. Ext. 4240 or 286-0295.

AIR CONDITIONER - Fedders, 7300 Btu, 11.5 amp, hardly used. Best offer. 924-3066.

BASSINET - With skirt, other baby items. Daly, 363-2497.

SUPER SPEAKERS - Altec Lansing "Voice of the Theater," natural oak and satin black finish, superb sound, leaving must sell. \$395/pr. Mike, Ext. 3390.

GARRARD - Record changer. \$17. Ext. 3658.

CAMPER - 10½ ft Maine pick up, sleeps 4, ice box, sink, gas heater. Best offer over \$800. EM 3-6119.

STEREO - Decca am/fm stereo radio, inputs for tape and guitar, Garrard record changer and 2 speakers. \$85. Ext. 4532 or 581-9199.

CYCLONE FENCE - 4' x 100', white vinyl covered complete with caps, post, rails, gate, excel cond, ready to install. \$125 or make offer. Sanchez, Ext. 4489, 698-3145.

WOOD BURNING - Kit range, cast iron, gd cond. W. Kane, Ext. 3841, 286-9450.

CAMPER - 1975 Cox Cadet, sleeps 4, \$875; high chair wood pecan maple, \$10; TV stand on wheels, \$3. 727-1617.

EVERGREEN - Spruce seedlings, 18" and 30" high. \$2 and \$5. Claire Hull, 281-2002.

ZENITH STEREO - Am/fm, walnut cabinet, excel cond. \$175. Mike, Ext. 2048.

PATIO UMBRELLA - 8½ ft round, good cond. \$20. 924-3236.

CAR STEREO - In dash, Pioneer GX2020, am/fm, new \$80. Dave Bernstein, Ext. 3145.

DYNACO PAT-5 - Factory built. \$210. Magurno, Ext. 2902.

STRAWBERRIES - Pick-em-yourself, Fire Place Neck Rd, Brookhaven Hamlet, 300 ft South of Cannon. Jim, 286-0024.

FOR ADOPTION - 4 yr old pedigree English Sheep-dog, also 12 wk old female puppy. Anne, 281-5287.

BICYCLE - Boy's 20" Spyder. \$10; brick & board bookcases. Best offer. P. Achey, Ext. 3129.

21' SWIMMING POOL - 3 yrs old, good cond, all alum with all accessories, 4' deep. \$425. 751-0448 eves.

TEA WAGON - Mahogany, \$35; maple gossip bench, \$15. 878-0717.

PORTA-POTTI - For camper or boat with base & chemical, perf cond. Phil, Ext. 4722.

DRAPE - Triple width antique satin, olive green, 86" long, queen size bedsprd to match, all for \$40. 928-0969.

GIRL'S BIKE - Rolyast 20", banana seat, highrise handle bars, excel cond. \$30. 286-1886 after 6 p.m.

POPULAR MECHANICS - Magazine, 1957-1974, complete, various engineering texts. Dennis Kirson, Ext. 4259 or Ext. 4267.

ROOF SHINGLE - Three squares, Bird Mark II, heavy duty, black. AT6-1253 eves.

WINDOWS - Used dbl hung, 31"x54" w/screens, 3 window setup, \$10/window, storms for above, \$10 ea. All for \$50. T. Morris, 744-5096.

POOL - 12'x3' deep, pump, filter, ladder, etc. \$50. John, Ext. 4543, 924-4262.

LVG RM CHAIRS - Dinette set, etc. 924-8262.

GE REFRIG - 15 cu ft, excel cond. Asking \$60. Dick, Ext. 4339, 654-2591.

Ads left out of this issue because of lack of space need not be re-submitted in order to run in next week's issue.

MISC ELECTRONIC GEAR - For parts, cheap. Ext. 4058, 286-0436.

ITALIAN PROV - Sectional, plastic covered, like new. \$350. 981-0651.

COMB STORM & SCREEN - Alum, 2 windows 35"x52", 1 door 30"x68". Ralph, Ext. 2485.

AIR COND - Philco 8000 Btu, very good cond. Asking \$150. 929-4522.

FORMICA - Table 20"x20" (2 shelves), \$10; 12"wx 60"lx26"h, 2 shelf bookcase unit, \$10; 1¼" well driv-ing outfit, \$25. 878-0717.

52 GAL - Electric hot water heater, \$25; 11"x11" Havahart animal trap, \$15. 878-0717.

2 FLOOR JACK POSTS - Adjustable, 72" to 84", \$10 ea; shallow well pump "Deming" double piston, \$60; 2 electric motors ¼x½ hp, \$10 ea. 878-0717.

SURFBOARD - Mako, 10'. \$15. Marty, Ext. 3753.

DISHWASHER - Sears Kenmore portable. \$60. 878-4878.

CONTENTS OF HOUSE - Bedrm furn, lvgrm, assorted items. Rich, Ext. 2982.

BEDROOM SET - Maple, twin beds, dresser mirror, drop leaf desk w/drawers & chair. \$250. EM 3-6798.

SHOES - Black leather dress pumps size 7, 2½" heel, worn only twice. \$15. Ext. 2348 or 727-6539 after 6 p.m.

RANGE - GE coppertone, elec 220 volt, excel work-ing cond. \$100. 331-1203 after 5:30 p.m.

HEATHKIT - 10-104, 15MHZ triggered scope, cali-brator, 10 mv/cm sensitivity, factory aligned. Bill, Ext. 4636.

DINETTE SET - Large formica wood grain table 42" x 60" plus 2-12" leaves & eight chairs. \$75. EM 3-6798.

HUTCH - Contemporary dining room w/glass cabi-net above, 18"d x 37"w x 68"h. \$50. Also old tools. EM 3-6798.

STEREO TAPE RECORDER - 6 heads, reversomatic, sound on sound, top cond. \$190. Azzara, Ext. 4701.

GOLF CLUBS - #1, 3 woods, 2, 3, 5, 7 & 9 irons & putter. \$30. Ralph, Ext. 2485.

STEREO AMPLIFIER - Eico, \$35; Whirlpool elec dryer, like new, \$60; Sabre saw, \$30. 862-8713.

BICYCLE - Boy's 20" Schwinn Sting Ray, 5 spd. \$45. 286-3815.

TRAILER HITCH - Heavy duty, for pick up truck. \$18. Bob, Ext. 4496.

RIFLES - Winchester 50; Game Master 760; Marlin 30-30; Winchester 67; J.J. Weston, Ithaca Ca 37. All in good cond, some collectors items only. Best offer. Barbara Nichols, 269-4768 after 6 p.m.

POOL LADDER - s/s for in-ground pool, \$35; double hung wood window, 68" x 52" w/alum storm & screens, \$55. 929-4318.

DRAIN PIPE - 3" diam plastic pipe 10 ft lengths. \$4. Les, Ext. 4074.

POOL LADDER - Stainless steel, 3 step. \$60. Mike, 4636.

BEDRM SET - Chest of drawers, 2 mirrors, dressing table, double bed, solid mahog, like new. \$250. 286-8921.

COLT .38 - 6 in. officer's match model, one quick load, 3 sets of grips. \$100 firm. Ext. 2238, 732-9168.

DRAPES - 125" x 84" and 50" x 84", printed sheers. Joe Ash, Ext. 2983.

DRIFTWOOD TABLE - W/glass top, \$75; two up-holstered chairs, green velvet print, \$25 each; two marble top round end tables, \$25 each. 924-7756 eves.

73 CAMPER - 11', well maintained, many extras, roomy, self-contained, ready for your truck. \$1950 for quick sale. Ext. 4051, 286-0436.

BICYCLE - Girl's hi-riser, banana seat, 3 spd. \$10. 929-4540.

LENS - 50-300 mm F.4.5 zoom auto-Nikkor, Nikon mount. Irv Meyer, Ext. 3038.

71 WINNEBAGO - AC, Dodge, 41,000 mi, generator, sleeps six. \$7500. PY 6-1317 after 6 p.m.

BICYCLE - Raleigh Sports, 3 spd, 19½", excel cond. \$85. Robert, 286-2265.

CAMERA - Mamiya T.L.R. C330 with 55 mm F 4.5, 80 mm F 2.8 lens, CDS Porro finder, waist level finder, camera bracket, filters & shade. Irv Meyer, Ext. 3038.

DRAPES - Orange damask custom made, use as tie backs or full 2 prs, one 101" length x 15' width with 144" under drape, one 11' x 95" length with white under drape. Orig cost, \$600, will sell for \$150.

Real Estate

Real Estate advertised for sale or rent is available without regard for the race, color, creed or national origin of the applicant.

For Sale

ROCKY POINT - 4 bedrm secluded chalet, overlooks LI Sound, fp, garage, pool. Bob, Ext. 3121, 744-5261.

MASSAPEQUA - 100 x 100 corner waterfront plot, util in st, garage, cesspool, trees. 727-7769.

MEDFORD PINES - Mother/daughter, priv entrances, 7 appl, 2 baths, 4 bedrm. \$5000 over mortgage. 654-3400.

SHOREHAM - Lux 4 bedrm ranch, 2½ baths, wooded acre, priv beach, mid 80's. Ext. 2439, 744-1428.

STONY BROOK - 4 bedrm Strathmore colonial, 2½ baths, full bsmt, garage, patio, carpeted, appl, mid 40's. Ext. 4518, 751-9038.

UPSTATE NY - Scenic Cooperstown, 12 & 20 acre parcels, reasonable. Ext. 3688, 363-7032.

WADING RIVER - 3-4 bedrm cape, ¾ treed acre, fp, w/w carpet, full bsmt. \$51,900. 929-8313 after 5:30.

SHIRLEY - 3 bedrm split, cath ceiling, garage, fp, 1½ baths, bsmt, cellar, lg lot, pool, fenced. \$36,000. 281-8222.

N SHIRLEY - 10 rms, ½ acre, extras. \$34,800. 878-9022.

CORAM - 3 bedrm townhse, 1½ baths, cent ac, ga-rage, use of pool & tennis. \$32,500. 928-0242.

SHOREHAM NORTH - 4 bedrm lg colonial, 2½ baths, den w/fp. \$55,000. 744-3660.

RIVERHEAD - 4 bedrm, 2 baths, lg kitchen, 2-car ga-rage. \$45,000. Frank McKay, 727-3249.

SHOREHAM - Charming older cape, 4 bedrm, land-scaped, ½ acre, 2 fp, bsmt, garage w/loft. \$55,000. Ext. 4228, 744-6043.

STONY BROOK - Framingham, 5 bedrms, 3 baths, pool, many extras, assum 6% mortgage, lovely. \$59,000. Ext. 3319, 751-7140.

MEDFORD - Birchwood Blue Ridge, 1 bedrm, w/w carp, appl, clubhouse, etc. \$29,500. 732-5252, 286-0838 eves.

N MASSAPEQUA - 3-4 bedrm split, 2-car garage, 2 baths, ac, fp, 6 appl, w/w carpet. \$45,000. PY6-1317.

MASTIC - 3 bedrm ranch, 1½ baths, corner lot, nr water, patio, immaculate, low 30's. 281-7531.

SHOREHAM - Immac 3 bedrm, den, 1½ baths, w/w carp, landscaped & fenced. \$37,500. 821-0761 after 5:30.

For Rent

E PATCHOGUE - 3 bedrm house, fp, nice location. \$275/mo. 363-6583.

BELLPORT VILLAGE - Spacious 2 bedrm apt, down-stairs, priv entr, garage bsmt, avail immed. \$325/ mo, incl all util. 286-8850.

POCONO VACATION - New chalet on Lake Wal-lepaupack. \$175/wk, \$650/mo. Fran, 289-2159.

BLUE POINT - 4½ rm house, unfurn, 2 bedrm, lg eat-in-kit, nr beach & canal. \$300 util incl, security, lease. 363-6845.

BELLPORT - 2 bedrm cottage, garage, bsmt, recently renovated, avail immed. \$210/mo + util. Karen, Ext. 3623, 286-1944.

SUMMER HOUSE - Nr lake in New Hampshire, sleeps 5-6, all util, completely furn, \$125/wk, also bunk hse to sleep 6 more. \$25/wk. Ext. 2470, 289-1608.

S SETAUKET - 2 rms in lg house, single person prefer-ably. \$90 or \$100/mo. 928-2954.

BELLPORT - Furn apt for a couple, no children, or one person. 286-9051 eves or Chris, Ext. 2907.

Wanted

VIOLIN - ½ size for student. Ext. 3828, 751-7250.

TENT - To sleep 4, good cond, want to spend about \$40. Ext. 2062, 286-8921.

STORM WINDOWS - 3 wooden, 23¾ x 39½ incl frames. 331-1203 after 5:30.

OLD DOLLS & RELATED ITEMS - Collector pays cash. 475-4199.

SUMMER RENTAL - Univ prof, wife & 3 children want to rent house 7/18-8/21, local refs. Call collect J. Dorning (217) 333-3139, 344-6927.

CAR - For student, reasonable price, reasonable cond. Hendrie, 286-1366.

BOAT - 10' aluminum w/floatation. Ext. 4192, 744-2461.

SKATEBOARD - Used fiberglass, good cond. Mickey, Ext. 3218.

MATCH BOXES - Empty wooden match boxes, lg or small for son's craft project. Mickey Haller, Bldg. 355, Ext. 3218.

LABEL